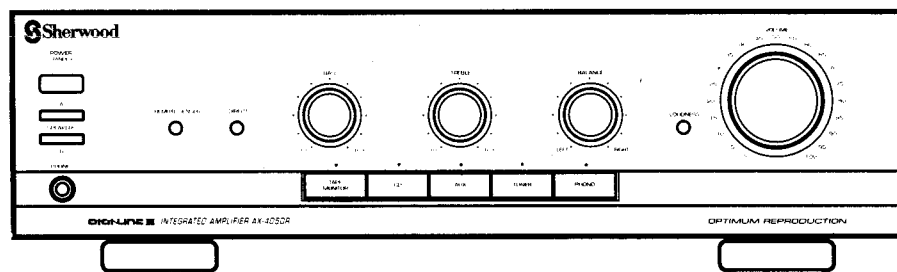


SERVICE MANUAL

AX-4050R STEREO INTEGRATED AMPLIFIER



■ CONTENTS ■

Safety Precautions	2
Specifications	3
Circuit Description	4
Block Diagram	5
Wiring Diagram	6
Troubleshooting	7
Mechanical Parts List	8

Exploded View(Cabinet & Chassis)	9
Printed Circuit Boards	11
Electrical Parts List	15
IC's Lead & Identifications	18
Schematic Diagrams	19
Transistors Lead & Identifications	23



SAFETY PRECAUTIONS

WARNING

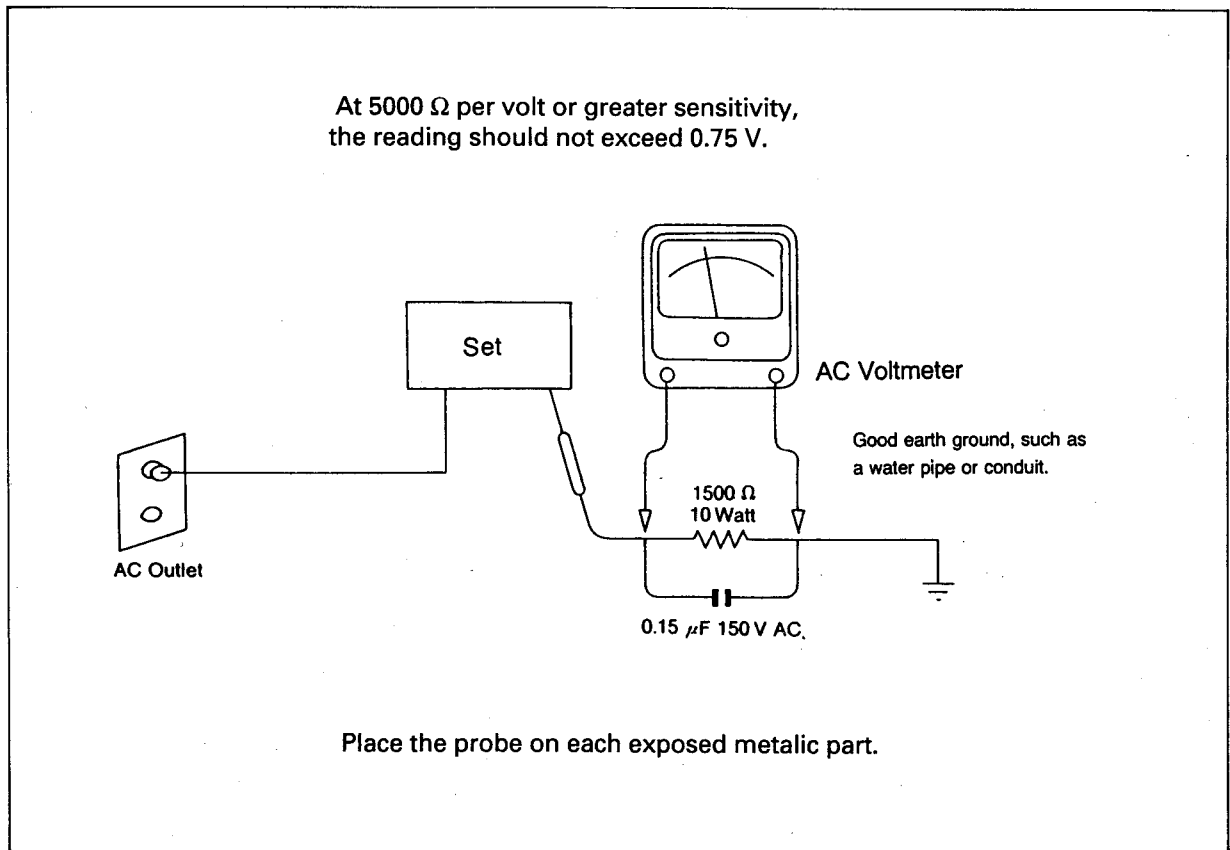
Before servicing this unit, familiarize yourself with the following precautions:

1. Many electrical and mechanical parts in this chassis have special safety characteristics that often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements: electrical components having such features are identified by ⚠ in the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

2. Before returning the set to the customer, always do an AC leakage current check on the

exposed metal parts of the cabinet, such as terminals, screw heads, and metal overlays, to be sure the set is safe to operate danger of electrical shock. Plug the AC line cord directly into a 120 V AC outlet (120 V AC version only). (Do not use a line isolation transformer during this check.) Be sure your AC voltmeter has a sensitivity of 5000 Ω per volt or greater. Then connect a 1500 Ω 10 watt resistor, paralleled by a 0.15 μ F 150 V AC capacitor, between a known good earth ground (such as a water pipe, or conduit) and the exposed metallic is parts, one at a time. Measure the AC voltage across the combination of a 1500 Ω resistor and a 0.15 μ F capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75V RMS. This corresponds to 0.2 mA AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



SPECIFICATIONS

No.	Description	Unit	Nominal	Limit
1	RMS output power; both channels driven at 40 Hz-20 kHz freq., 0.08% THD, 8 Ω load. both channels driven at 1 kHz freq., 0.08% THD, 8 Ω load	W W	≥ 53 ≥ 55	≥ 50 ≥ 50
2	Inter Modulation distortion (60 Hz:7 kHz=4:1 SMPTE) at 8 Ω load, 50 W output.	%	≤ 0.03	≤ 0.05
3	Input sensitivity at 1 kHz freq., 8 Ω load, 50 W output.	PHONO CD, TAPE mV mV	2.5 ± 0.2 150 ± 10	2.5 ± 0.3 150 ± 30
4	PHONO overload at 1 kHz freq., 0.1% THD PHONO input \rightarrow TAPE2 MON. output	mV	≥ 145	≥ 140
5	PHONO equalization RIAA 40 Hz - 20 kHz, TAPE2 MON. output	dB	RIAA ± 1	RIAA ± 1.5
6	Frequency response at -3 dB	CD, TAPE Hz	10 - 55000	20 - 50000
7	Signal to noise ratio IHF-A weighted at volume max.	PHONO CD, TAPE dB dB	≥ 73 ≥ 95	≥ 70 ≥ 90
8	Tone control at 1 kHz 0 dB	100 Hz 10 kHz dB dB	$\pm 10 \pm 1$ $\pm 10 \pm 1$	$\pm 10 \pm 2$ $\pm 10 \pm 2$
9	Channel Separation at input shorted CD, TAPE	1 kHz 10 kHz dB dB	≥ 55 ≥ 53	≥ 50 ≥ 50
10	Crosstalk at 1 kHz freq. input shorted	CD \Rightarrow PHONO dB	≥ 67	≥ 65
11	Total harmonic distortion at 40 Hz - 20 kHz freq., 8 Ω load, 50 W output	40 Hz 1 kHz 20 kHz % % %	≤ 0.03 ≤ 0.03 ≤ 0.03	≤ 0.05 ≤ 0.05 ≤ 0.05

General

Speaker load impedance 8 Ω
 Power consumptions 340 W
 Dimensions (W \times H \times D) 440 \times 110 \times 245 mm
 (17-5/16 \times 4-11/16 \times 9-11/16)
 Weight (Net) 6.3 kg
 (13.9 lbs)

Power requirements:

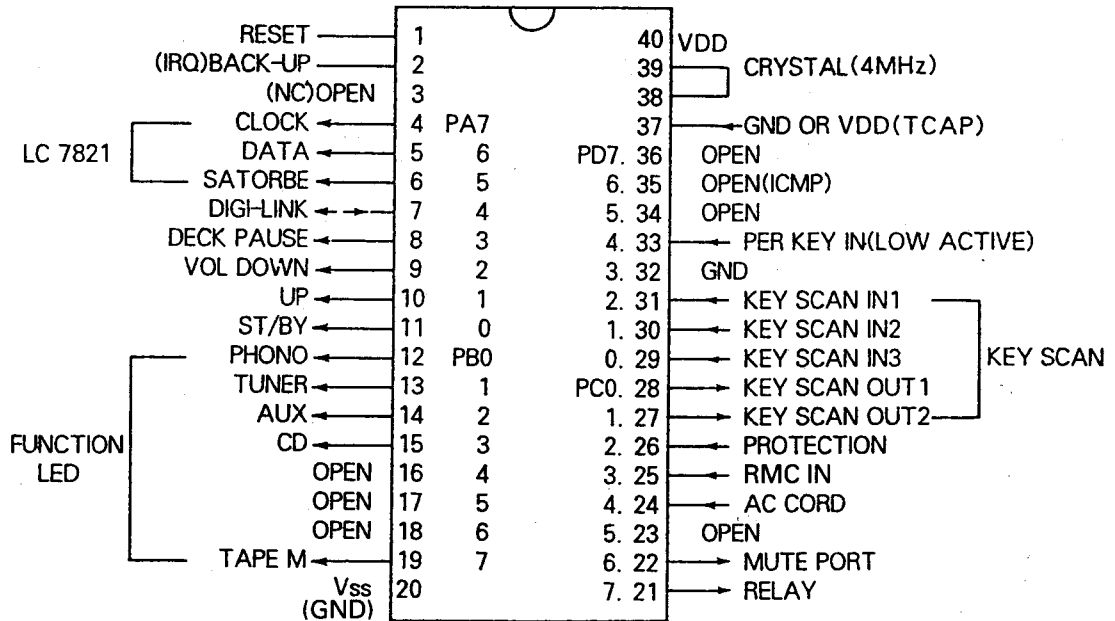
A: 120 V 60 Hz for American/Canadian version
 B: 120/220 V 60/50 Hz multi voltage version (switchable)
 D: 230 V 50 Hz German/Gemeral European version
 E: 240 V 50 Hz for UK/Australian version
 G: 220 V 50 Hz for Other Area

Notes:

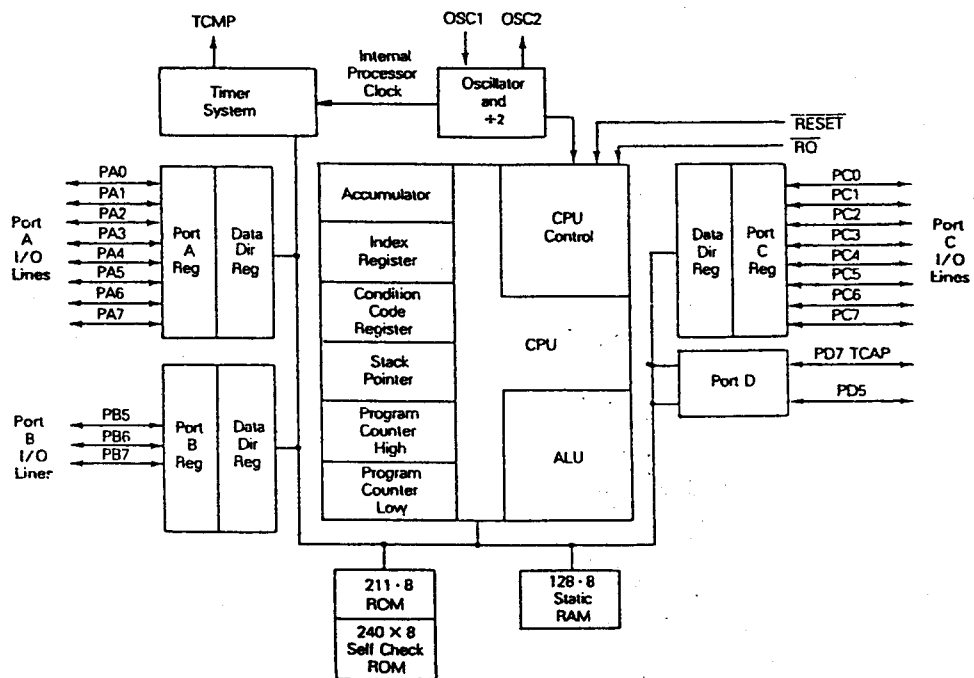
1. Nominal specs represent the design specs. All units should be able to approximate these some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable: in no case should a unit fail to meet limit specs.
2. This manual is based on the European (D) standard, and provides information on regional circuit modification throught the use of alternate schematic diagram or wiring diagram, and information on regional component variations through the use of parts lists. Design and specifications subject to change without notice.

CIRCUIT DESCRIPTION

Pin assignment

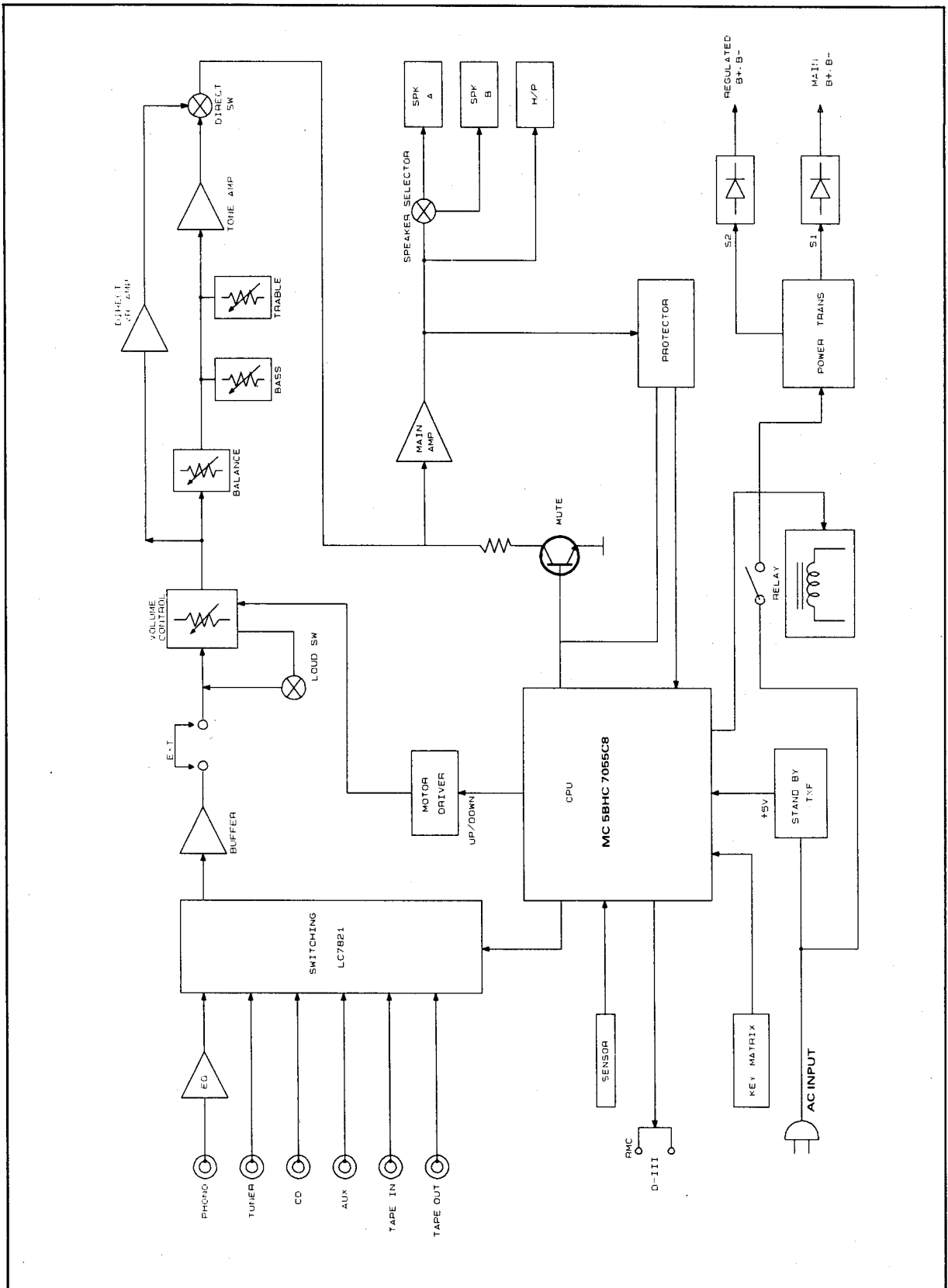


Block Diagram



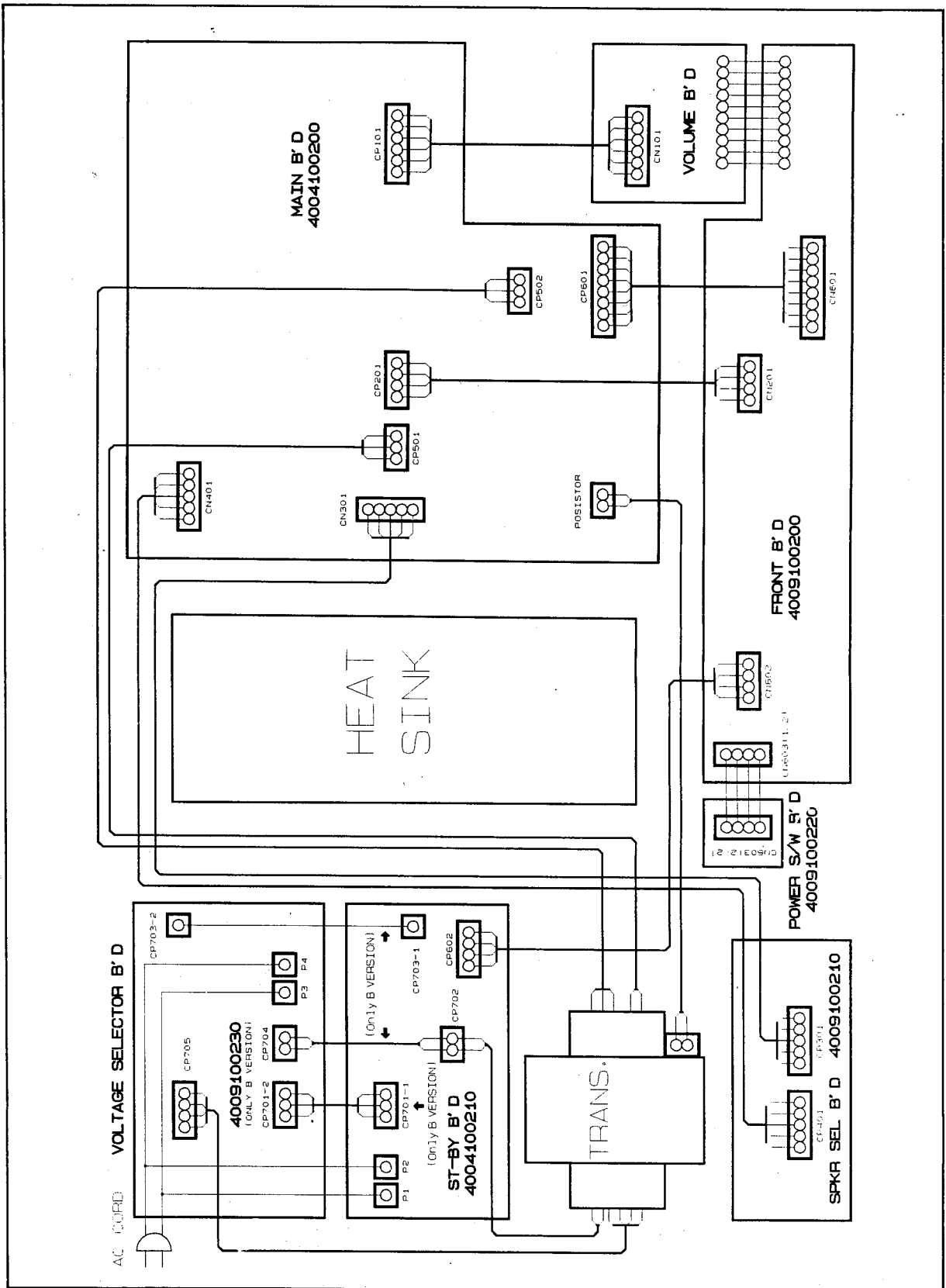
BLOCK DIAGRAM

Model No. : AX-4050R



WIRING DIAGRAM

Model No. : AX-4050R



TROUBLESHOOTING

Symptom	Cause and Remedy
Amplifier inoperative.	<ul style="list-style-type: none"> ● Faulty AC power cord. Replace. ● Defect in the power switch. Replace. ● Broken wire in the power transformer. Replace the power transformer. ● Blown fuse. Replace the fuse.
Fuse blows when power is turned on.	<ul style="list-style-type: none"> ● Defective power transformer. Replace. ● Short in the primary or secondary of the transformer circuitry. Replace. ● Damaged rectifying diodes D601~D604. Replace the defective diode(s). ● Short in the rectifying circuit. Repair the short.
No sound from both channels or one channel	<ul style="list-style-type: none"> ● Speaker switch A or B defective. Replace the defective switch(es). ● Defective in transistor Q311L/R, Q312L/R on the main board. Replace the defective transistor(s).
Headphones inoperative.	<ul style="list-style-type: none"> ● Defective resistor R401L/R. Replace.
All the inputs inoperative.	<ul style="list-style-type: none"> ● Defective IC IC102, IC103, IC201, IC202. Replace the defective IC(s).
All the inputs work normally except phono.	<ul style="list-style-type: none"> ● Defective IC101. Replace.
Loudness has no effect.	<ul style="list-style-type: none"> ● Defective loudness switch. Replace. ● Defective R201L/R, R202L/R, C201L/R, C202L/R. Replace
Bass control has no effect.	<ul style="list-style-type: none"> ● Variable resistor VR204 defective. Replace. ● Defective R212L/R, R213L/R, C212L/R, C213L/R. Replace.
Treble control has no effect.	<ul style="list-style-type: none"> ● Variable resistor VR203 defective. Replace. ● Defective R214L/R, R215L/R, C214L/R. Replace.

MECHANICAL PARTS LIST

Ref. No.	Description	Part No.	Q'ty	Version	Ref. No.	Description	Part No.	Q'ty	Version
	Packaging Materials				42	Adapter	4428300410	1	PT INDO(Only)
	Cushion Poly	9722030710	1		43	Switch, Voltage Sel., Slide 6P	4618006510	1	PT INDO(Only)
	Film Soft PE	9715000120	1		44	Switch, Voltage Sel., Slide 3P	4618006610	1	PT INDO(Only)
	Poly Bag	9705001550	1			Screws			
	Box Carton	049605172132	1		S1-S5	#2BTC 3x8B, Black	8109230083	5	
	Accessories				S6-S11	#2WPTC 3x8Y, Yellow	8159230081	6	
	Battery 1.5 V AA(R6M)	5518001610	2		S12-S22	#2BTC 3x8B, Black	8109230083	11	
	Manual Instruction	9007018100	1	KS	S23	#2WPTC 3x8Y, Yellow	8159230081	1	
	Manual Instruction	9007018101	1	D	S24	#2BTC 3x8B, Black	8109230083	1	
	Manual Instruction	9007018102	1	PT INDO	S25-S28	BSAM 4x8B, Black	8109440083	4	
	Ass'y Commander	058581000166	1		S29	#2BTC 3x8B, Black	8109230083	1	
	Ass'y Commander	058581000165	1	KS	S30	#2BTC 3x6B, Black	8109230063	1	
	Cabinet & Chassis				S31	#2BTC 3x6B, Black	8109230063	1	
1	Knob Main, ABS, Black	048543064011	1		S32-S34	#2BTC 3x8B, Black	8109230083	3	
2	Knob Rotary, ABS, Black	048545126611	3		S35-S40	HEX MPSW 3x12Y, Yellow	8099130121	6	
3	Panel Front, ABS, Black	048501034611	1	KS	S41-S46	#2WPTC 3x8Y, Yellow	8159230081	6	
	Panel Front, ABS, Black	048501034612	1		S47-S55	#2BTC 3x6B, Black	8109230063	9	
4	Badge, Inkel	048535038511	1	KS	S56-S59	#2BTC 3x8B, Black	8109230083	4	
	Badge, Sherwood	048535342011	1		S60-S63	#1PT 3x10B, Black	8119130103	4	
5	Guide LED	8555043110	6		S64-S68	#2BTC 3x8B, Black	8109230083	8	
6	Button Power, ABS, Black	8543062910	1		S69-S76	#1PT 3x10B, Black	8119130103	8	
7	Window Sensor	8555046110	1		S77	Ground	8155000710	1	
8	Jack Phone, Gold Ring	4438005010	1		S78-S79	#2BTC 3x8B, Black	8109230083	2	
9	Switch Speaker Selector, Push	4628056410	2		S80	#2PTC 4x6Y, Yellow	8119240061	1	
10	Button Speaker Sel., Push, ABS, Black	8545126210	2		S81-S82	#2BTC 3x8B, Black	8109230083	2	
11	Bracket Speaker, Shield	6165149210	1		S83-S86	BSAM 4x8B, Black	8109440083	4	
12	Knob Function, ABS, Black	048543064111	1	KS	S87	#2WPTC 3x8Y, Yellow	8159230081	1	
	Knob Function, ABS, Black	048543064112	1			Miscellaneous			
13	Shield Fence, Volume	6165150610	4			Lead Ass'y, 5P, 450mm, From CN301 to CP301	436105453021	1	
14	Shield Fence, Function	6163114910	1			Lead Ass'y, 5P, 400mm, From CN401 to CP401	436105403061	1	
15	Button Direct Switch, ABS, Black	8545126710	2			Power Transformer, 220 V, 60 Hz	2828100283	1	KS
16	Switch Tact, SW2, SW3, SW4, SW5, SW6	4658003710	6			Power Transformer, 230 V, 50 Hz	2828100381	1	D
17	Holder, Sensor	6515014110	1			Power Transformer, 110/220 V, 50/60 Hz	2828100391	1	PT INDO
18	Switch Direct, Push	4628043810	2		P1	P.C.Board Main	4004100200	1	
19	Volume BASS/TREBLE, with Nut	3208069010	2		P1-1	P.C.Board Stand-by	4004100210	1	
20	Volume Main, with Nut	3208065110	1		P2	P.C.Board Front	4009100200	1	
21	Frame Left, SECC	6122631220	1		P2-1	P.C.Board Speaker Selector	4009100210	1	
22	Heatsink Power, Aluminum	7502007420	1		P2-2	P.C.Board Power Switch	4009100220	1	
23	Bracket PCB, SECC	6505130010	1		P2-3	P.C.Board Voltage Selector	4009100230	1	PT INDO(Only)
24	Speaker Terminal, 8P	4408105510	1	KS, PT INDO					
	Speaker Terminal, 8P	4408105810	1	D					
25	Jack RCA Degi-Link, 2P	4438112010	1						
26	Jack RCA EXT IN/OUT, 4P	4438103110	1						
27	Jack RCA TAPE IN/OUT, CD, 6P	4438103210	1						
28	Jack RCA AUX, TUNER, PHONO, 6P	4438108010	1						
29	Sponge Rubber	6715024810	1						
30	Cover Bottom, SECC	6122419510	1						
31	Frame Right, SECC	6122620340	1						
32	Foot, Gold Ring	046033102611	2	KS					
	Foot, Gold Ring	046033102511	2						
33	Foot, Black	6033102510	2						
34	Outlet	4448105510	2	KS					
	Outlet	4448103610	2	D,PT INDO					
35	Chassis Back, SECC	046102042411	1	KS					
	Chassis Back, SECC	046102042451	1	D					
	Chassis Back, SECC	046102042491	1	PT INDO					
36	Stopper Cord, ABS, Black	6513000310	1	KS					
	Stopper Cord, ABS, Black	6518000111	1						
37	Cord Power, ABS, Black	4308007410	1						
	Cord Power, ABS, Black	4308000430	1						
38	Plug Jumper	4328204210	2						
39	Terminal Ground	4408104910	1	KS					
	Terminal Ground	4408103720	1						
40	Cover Top, SECC	046122021331	1						
41	Volume Balance with Nut	3208067810	1						

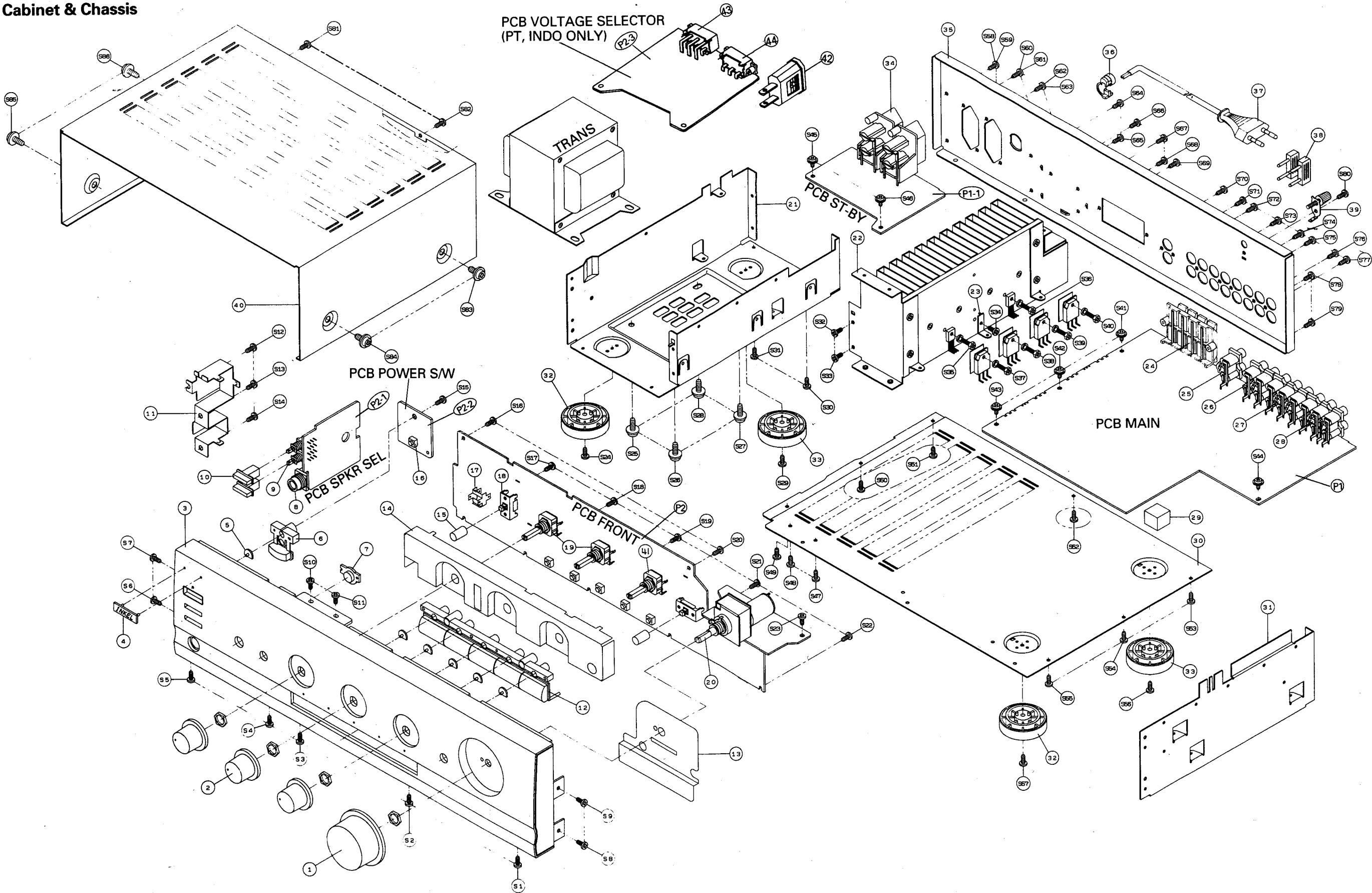
PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol Δ in the parts list and the safety can be of special significance. When replacing a component identified with Δ , use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

EXPLODED VIEW

Model No. : AX-4050R

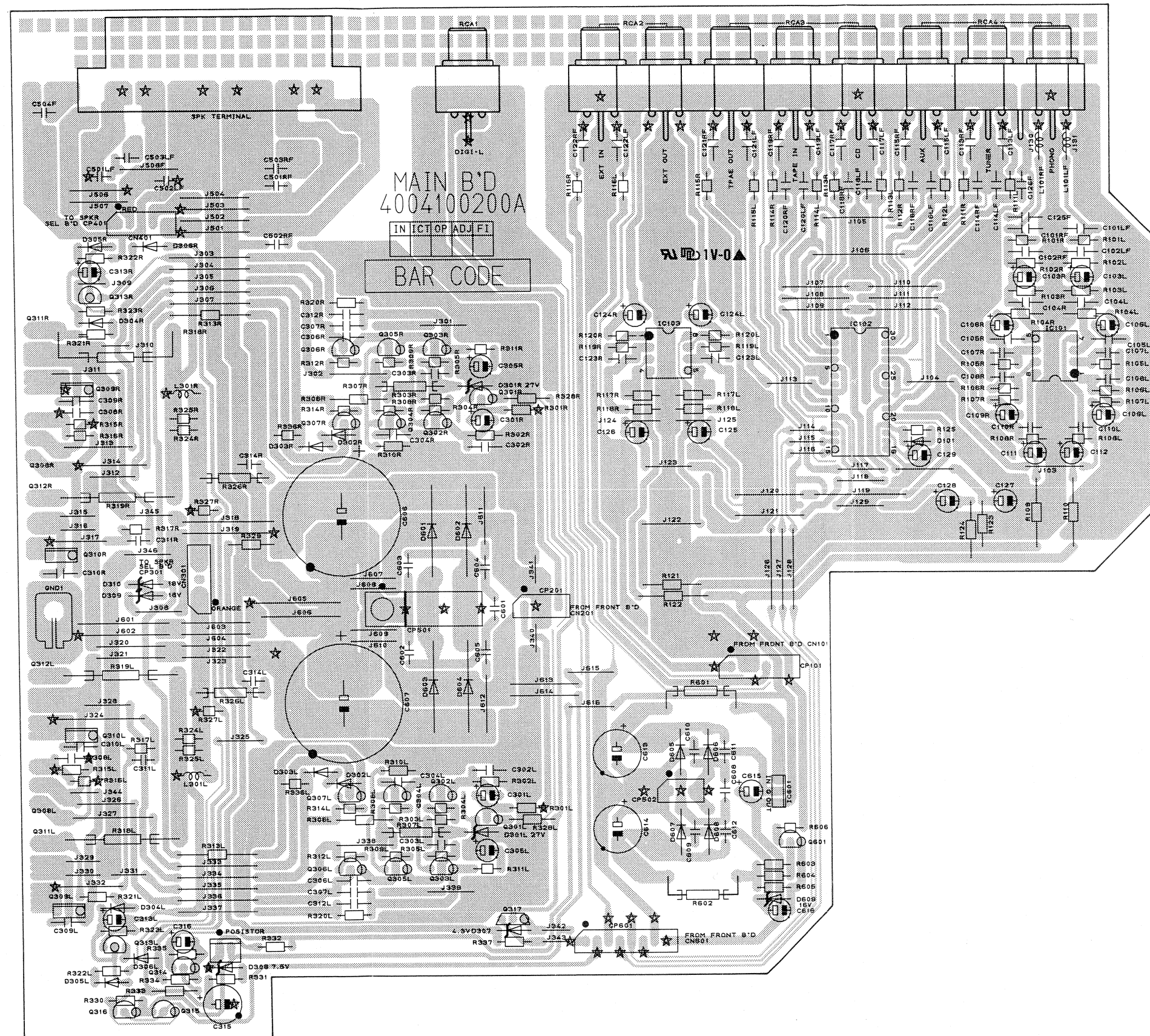
Cabinet & Chassis



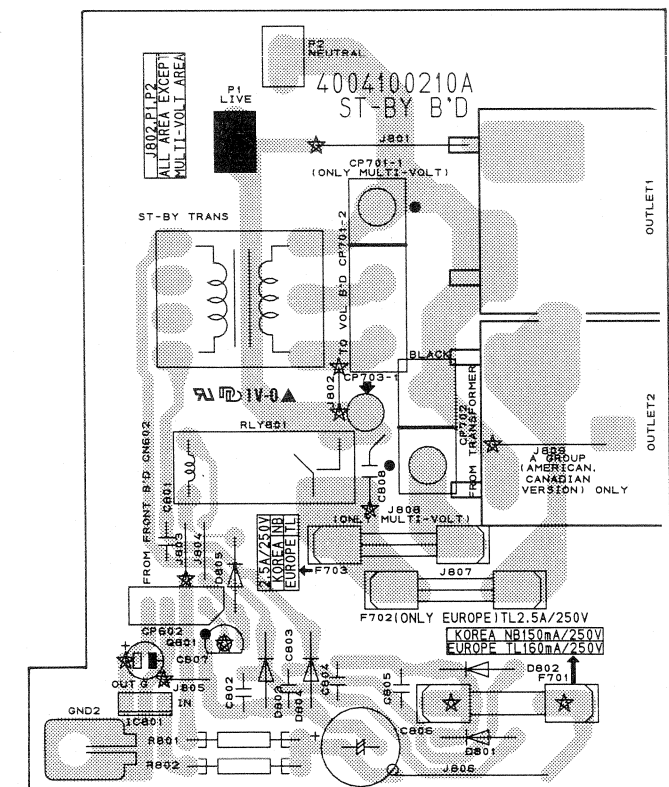
PRINTED CIRCUIT BOARDS

Model No. : AX-4050R

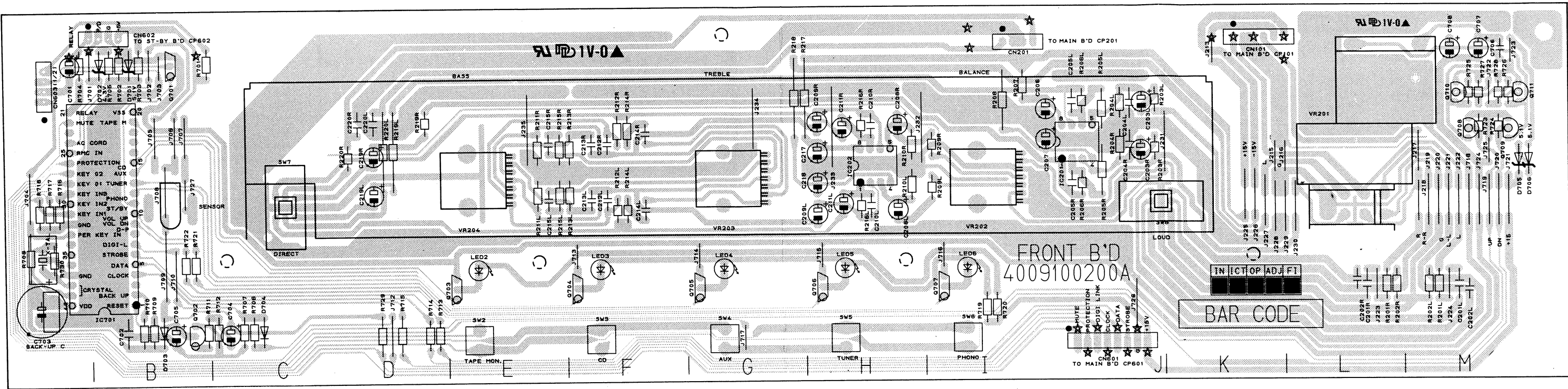
P.C.Board Main(4004100200)



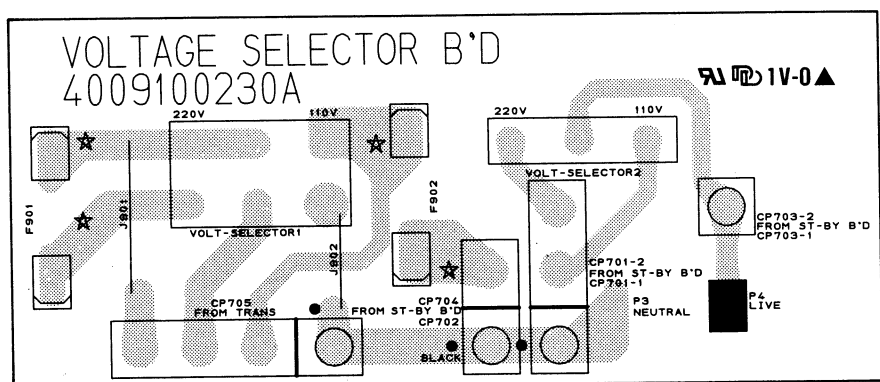
P.C.Board ST-BY (4004100210)



P.C.Board Front (4009100200)

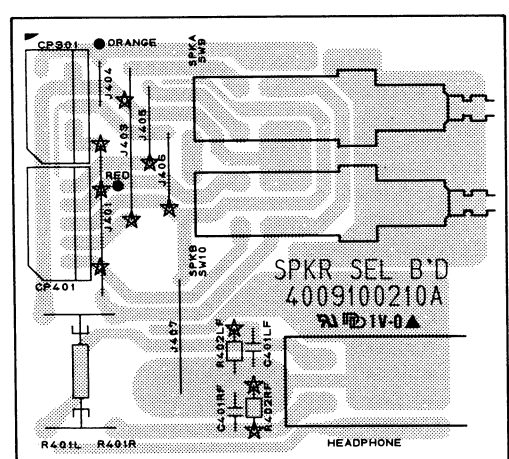


P.C.Board Voltage Selector(4009100230)

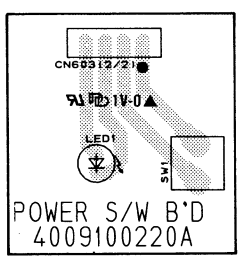


PT INDO Version Only

P.C.Board SPKR SEL (4009100210)



P.C.Board Power S/W (4009100220)



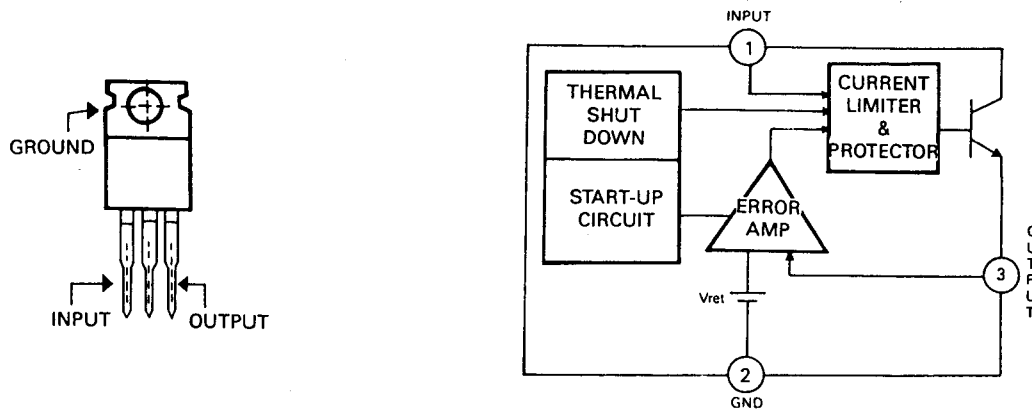
Ref. No.	Description	Part No.	Q'ty	Version	Ref. No.	Description	Part No.	Q'ty	Version
R211L/R	Carbon Film	100 kohm 1/5 W J	3069104970	2		Ass'y P.C.Board Power Switch			
R212L/R	Carbon Film	18 kohm 1/5 W J	3069183970	2		LED			
R213L/R	Carbon Film	3.9 kohm 1/5 W J	3069392970	2	LED1	SLR-34RCN49, Red	2381215704	1	
R214L/R	Carbon Film	1 kohm 1/5 W J	3069102970	2		Connector			
R215L/R	Carbon Film	560 ohm 1/5 W J	3069561970	2	CN603(2/2)	A pair of CN603(1/2)		1	
R216L/R	Carbon Film	1Mohm 1/5 W J	3069105970	2		Miscellaneous			
R217/R218	Carbon Film	100 ohm 1/5 W J	3069101970	2	16	Switch Tact, SW1	4658003710	1	
R219L/R	Carbon Film	100 ohm 1/5 W J	3069101970	2		End of P.C.B Power Switch			
R220L/R	Carbon Film	1 kohm 1/5 W J	3069102970	2		Ass'y P.C.Board Speaker Selector			
R701	Carbon Film	1 kohm 1/5 W J	3069102970	1		Capacitors			
R702	Carbon Film	10 kohm 1/5 W J	3069103970	1	C401L/R/F	Ceramic Tubular	560 pF 50 V J	3519561935	2 D(Only)
R703	Carbon Film	100 kohm 1/5 W J	3069104970	1		Resistors			
R704	Carbon Film	330 ohm 1/5 W J	3069331970	1	R401L/R	Metal Film	470 ohm 1 W J	3029471470	2
R705	Carbon Film	1 kohm 1/5 W J	3069102970	1	R402L/R/F	Carbon Film	15 kohm /5 W J	3069153970	2 D(Only)
R706	Carbon Film	22 kohm 1/5 W J	3069223970	1		Connectors			
R707	Carbon Film	220 kohm 1/5 W J	3069224970	1	CP301	Wafer, 5P, Angle		4428513450	1
R708	Carbon Film	100 kohm 1/5 W J	3069104970	1	CP401	Wafer, 5P, Angle		4428513450	1
R709	Carbon Film	10 kohm 1/5 W J	3069103970	1		Miscellaneous			
R710	Carbon Film	100 kohm 1/5 W J	3069104970	1	8	Jack Phone, Gold Ring		4438005010	1
R711	Carbon Film	1 kohm 1/5 W J	3069102970	1	9	Switch Speaker Selector, Push		4628056410	2
R712-R715	Carbon Film	10 kohm 1/5 W J	3069103970	4		End of P.C.B Speaker Selector			
R716-R718	Carbon Film	330 kohm 1/5 W J	3069334970	3		Ass'y P.C.Board Voltage Selector			PT INDO(Only)
R719-R722	Carbon Film	1 kohm 1/5 W J	3069102970	4		Fuses			
R723/R724	Carbon Film	4.7 kohm 1/5 W J	3069472970	2	F901	T 2.5 A, 250 V		5508302535	1
R725-R728	Carbon Film	1 kohm 1/5 W J	3069102970	4	F902	T 4 A, 250 V		5508302935	1
R729	Carbon Film	10 kohm 1/5 W J	3069103970	1		Connectors			
R730	Carbon Film	1 Mohm1/5 W J	3069105970	1	CP701-2	Wafer, LV, 3P		4428525790	1
	Diodes				CP703-2	Wafer, LV, 1P		4428525770	1
D701	Zener, UZ 5.1BSB	2258599103	1		CP704	Wafer, LV, 2P		4428525780	1
D702	Zener, UZ 4.3BSB	2258599102	1		CP705	Wafer, LV, 4P		4428525800	1
D703/D704	1N4148, Switching	2058322101	2			Miscellaneous			
D705/D706	Zener, UZ 5.1BSB	2258599103	2		P3	Pin Solder		4428001410	1
	LEDs				P4	Pin Solder		4428001410	1
LED2	SLR-34RCN49, Red	2381215704	1		42	Adapter		4428300410	1
LED3-LED6	SLR-34YCN49, Yellow	2384521501	4		43	Switch, Voltage Sel., Slide 6P		4618006510	1
	Transistors				44	Switch, Voltage Sel., Slide 3P		4618006610	1
Q701	DTC114Y	2208622106	1			End of P.C.B Voltage Selector			
Q702	KTC1815Y/BKTC3198, NPN, Silicon	2208606104	1						
Q703-Q707	DTC114Y	2208622106	5						
Q708/Q709	MPSA06Y, NPN, Silicon	2208606114	2						
Q710/Q711	MPSA56Y, PNP, Silicon	2208206113	2						
	ICs								
IC201/IC202	KIA4559P/KIA75559P, OP AMP.	2168208104	2						
IC701	LSC412329P, DWP115, CPU	2138309172	1						
	Connectors								
CN101	Lead Ass'y, 6P, 100mm	436106103321	1						
CN201	Lead Ass'y, 4P, 200mm	436104203321	1						
CN601	Lead Ass'y, 8P, 100mm	436108103321	1						
CN602	Lead Ass'y, 4P, 280mm	436104283321	1						
CN603(1/2)	Lead Ass'y, 4P, 180mm, A pair of CN603(2/2)	436404183221	1						
	Miscellaneous								
SENSOR	Remote Sensor TFMS-5380B	2408005003	1						
16	Switch Tact, SW2, SW3, SW4, SW5, SW6	4658003710	5						
17	Holder, Sensor	6515014110	1						
19	Volume BASS/TREBLE, with Nut	3208069010	2						
20	Volume Main, with Nut	3208065110	1						
41	Volume Balance with Nut	3208067810	1						
	End of P.C.B Front								

PRODUCT SAFETY NOTICE

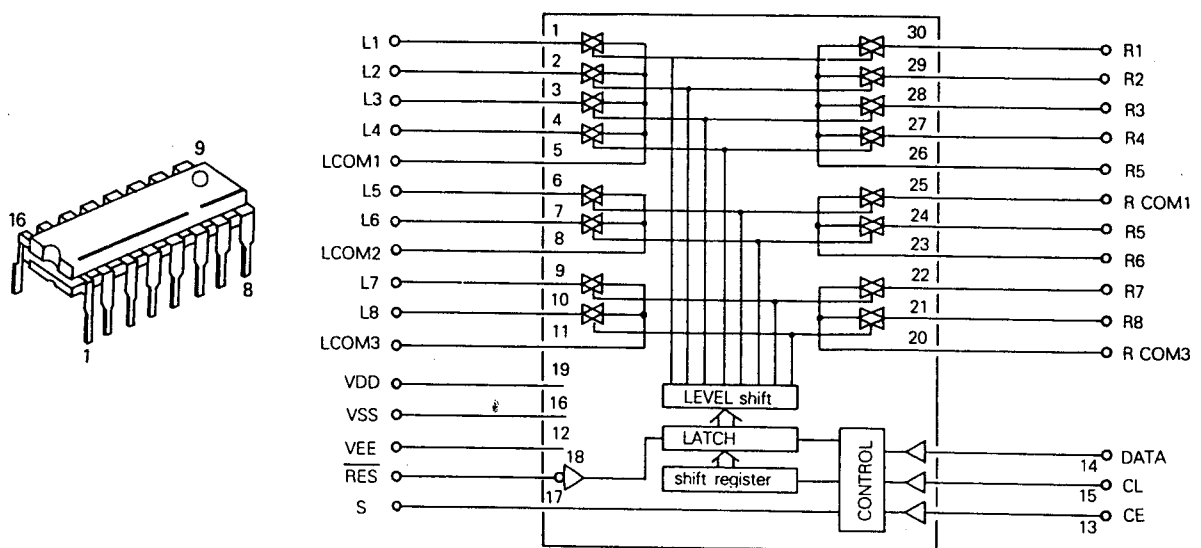
Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol Δ in the parts list and the safety can be of special significance. When replacing a component identified with Δ , use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

IC'S LEAD IDENTIFICATIONS & INTERNAL DIAGRAM

GD78XX : IC601, IC801

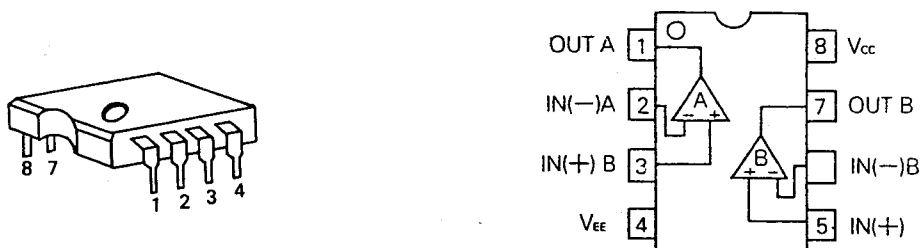


LC7821 : IC102



KIA7559P/KIA4559P

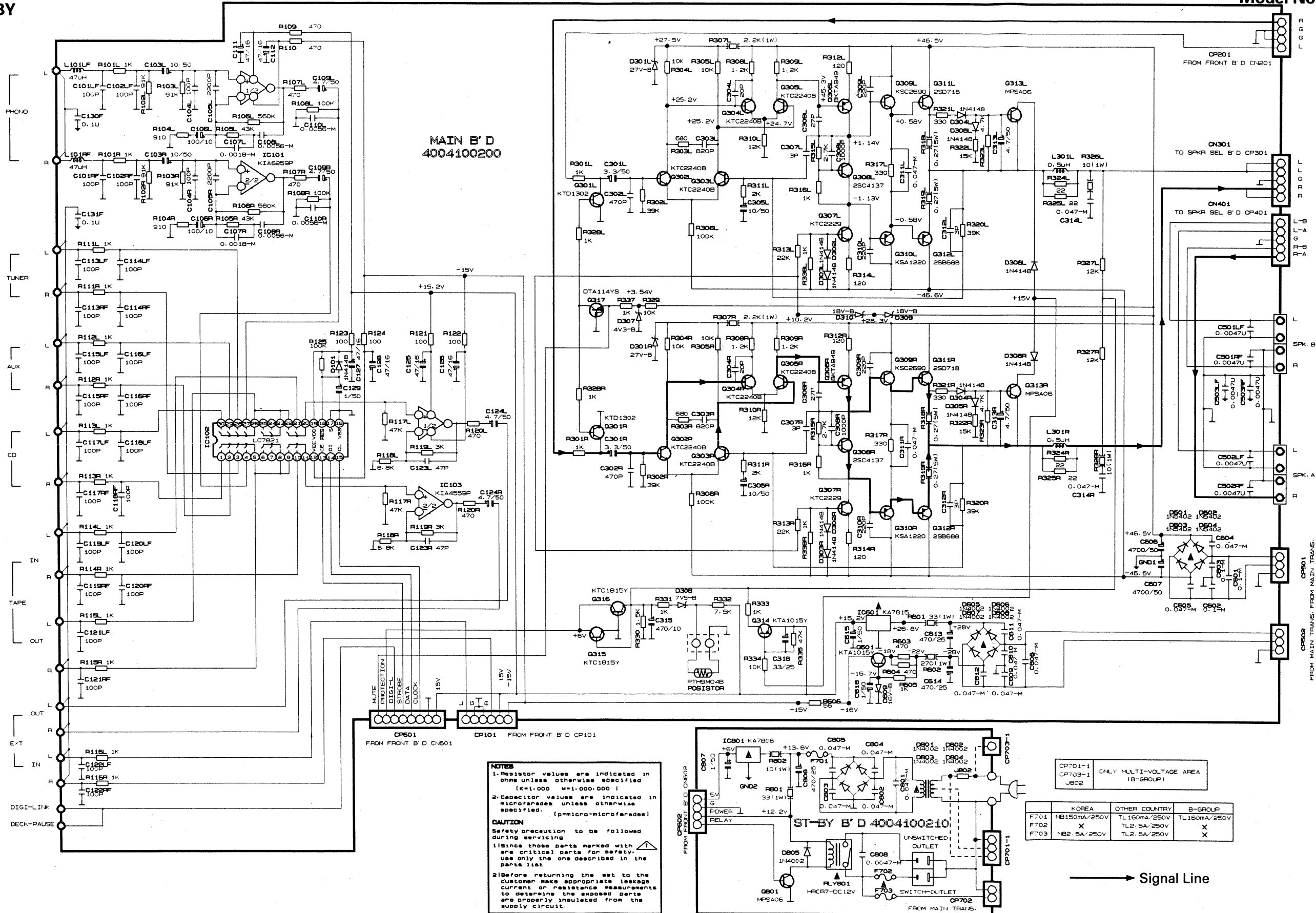
KIA6259P : IC101, IC103 IC201, IC201



SCHEMATIC DIAGRAM I

Model No. : AX-4050R

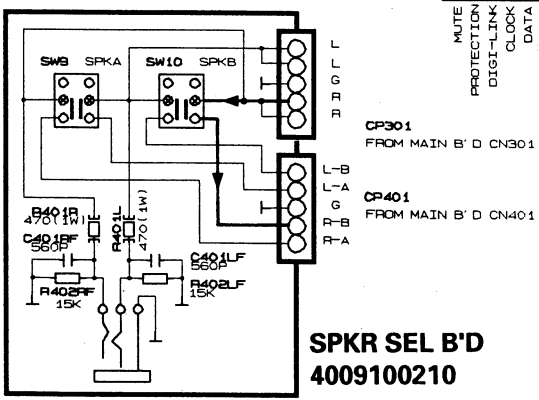
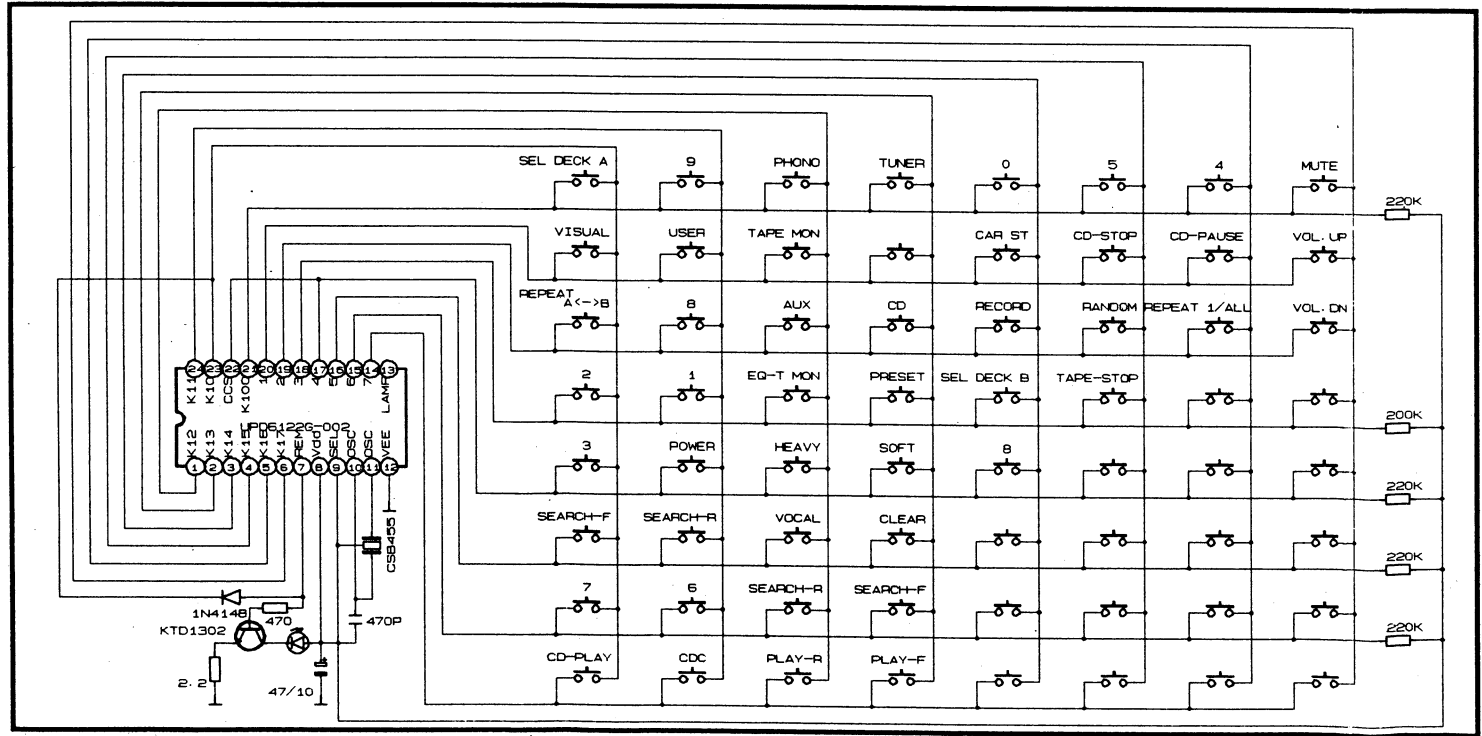
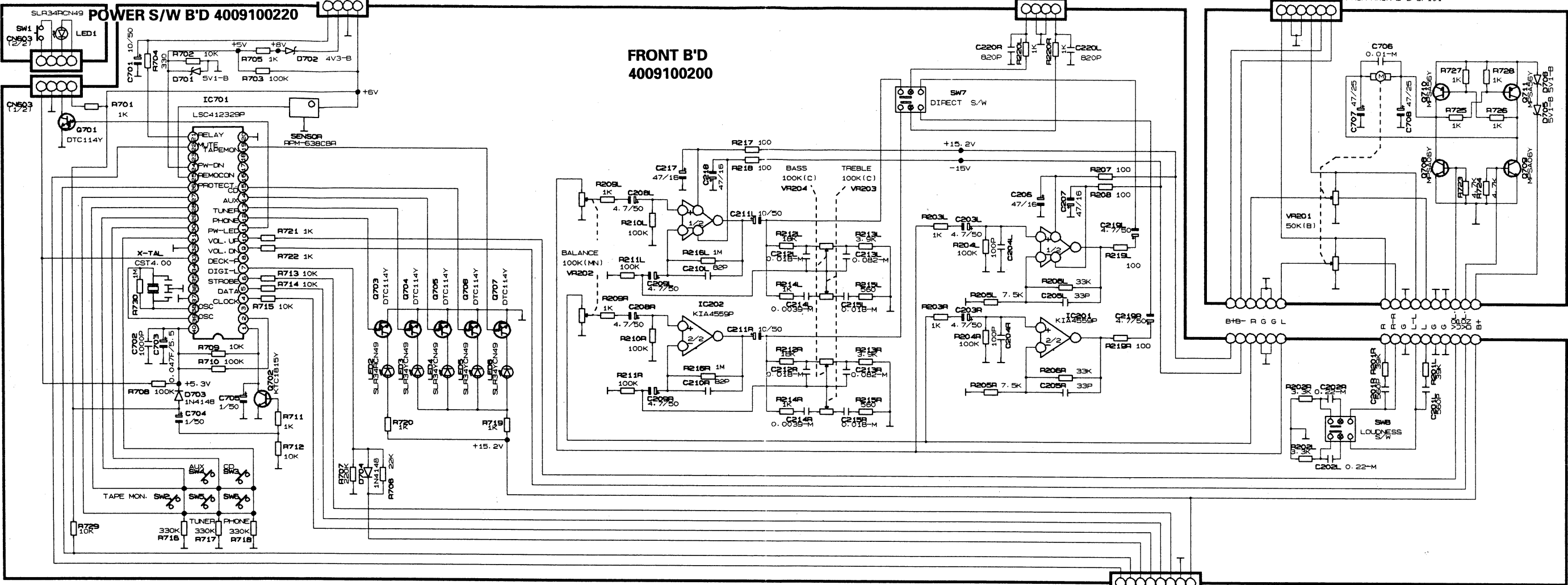
MAIN/ST-BY



SCHEMATIC DIAGRAM II

Model No. : AX-4050R

FRONT/SPKR SEL/VOLTAGE SELECTOR



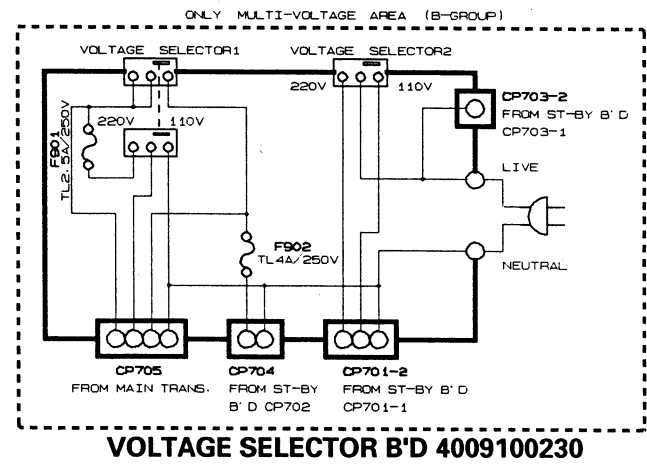
NOTES

1. Resistor values are indicated in ohms unless otherwise specified (K=1,000 M=1,000,000)
2. Capacitor values are indicated in microfarads unless otherwise specified. (p=micro-microfarads)

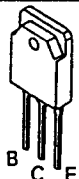

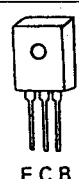

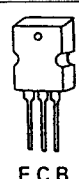

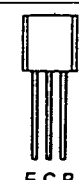





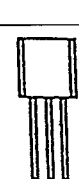

CAUTION

Safety precaution to be followed during servicing:

- 1) Since those parts marked with a triangle are critical parts for safety, use only the one described in the parts list.
- 2) Before returning the set to the customer make appropriate leakage current or resistance measurements to determine the exposed parts are properly insulated from the supply circuit.



TRANSISTORS LEAD IDENTIFICATION

TRANSISTORS	FRONT VIEW	BOTTOM VIEW
KTB688/2SB688 KTD718/2SD718		
KSC2690 KSA1220		
2SC4137		
KTA1015/KTA1266 KTC1815/KTC3198 KTC2240/KTC3200 KTD1302		
KTC114YS KTA114YS		
KTA949/KTA1024 KTC2229/KTC3206		
MPSA06 MPSA56		
	TERMINAL NAME	
	B→BASE C→COLLECTOR E→EMITTER	